Editorial Index to Volume 214

January to December 1986

A

Annual Technical Review of European Steelmaking. Sept 470

120th Anniversary

From Bessemer to microprocessor by W K V Gale. Feb 60

B

BISPA Annual Review

BISPA cooperates more closely with BSC by P Johnson. Mar 113

Static demand for BISPA products by B D Insch. Mar 113

Brymbo's new inspection line retains the accent on quality. Mar 121

Sheerness invests in process control. Mar 124

Quality key to bright bar success. Mar 128

UMB is 'fit for purpose'. Mar 129

Brasway Tubes installs six cut-to-length saws. Mar 142

Bromford Iron & Steel

Hot rolling at Bromford Iron & Steel by W K V Gale. Sept 510

BSC

BSC Teesside works introduces continuously cast slabs for rolling heavy beams and columns. Feb 97

Rotary valve helps raise CC ratio at Teesside Works. Mar 152

Ceramic stopper reduces slag carry over at Lackenby BOS plant. Jne 318

BSC Ravenscraig repairs reversing rougher mill housing. Jne 318

BSC's No 6 hot dip coating line comes on stream. Jly 338

Western Europe's biggest BF starts second campaign at Redcar. Oct 558

Corrosion protection of gas distribution mains (Llanwern). Nov 622

Bulk Materials Handling

Dynamic measurement on stacker/reclaimer. Jne 295

Special purpose transport systems for intra-plant handling. Jne 298

Sub contracting as an effective means of bulk handling. Jne 300

BSC Port Talbot installs in-motion weighing. Jne 302

Bulk discharging system for shipboard or quayside installation. Jne 304

C

Coal injection in steelmaking

Coal injection in steelmaking — a summary of current technology. Feb 76

The ALCI process — Arbed Lance Coal Injection by J Goedert, H Klein, R Henrion, J F Liesch. Feb 80

KMS process for coal injection in the converter. Feb 83

Steelmaking using the EOF. Feb 88

Pulverised coal — a novel metering system. Feb 90

Klöckner sells KMS license to Japan and agrees coal based stainless steelmaking venture. Feb 92

Continuous annealing at Hoesch Stahl AG. Apr 198

Continuous annealing of steel strip by Rodney Pitt. Jan 28

Control of rolling

Process control of flat and long product rolling. Nov 604

On-line optical gauging of steel rolling processes. Nov 608

Models for modern rolling mills. Nov 610

Extension of rolling mill examination systems to cover microstructural phenomena by E Anelli, M Ghersi, A Mascanzoni, A Aprile, G Rizzo. Nov 612

Off-line rolling mill modelling. Nov 616

Crop shear for hot strip at Solmer. Nov 618

Combination tension and screwdown AGC for cold reversing mills. Nov 620

Rapid setting up of rod and bar mills. Nov 620

D

DC arc furnace

DC arc furnace in full production at French minimill. Apr 204

Operation of the dc arc furnace at Nucor. Jly 344

E

ECSC Research — in iron & steel

Pollution control. Aug 447

Steelmaking, Refractories, Inspection. Sept 516

Continuous casting. Sept 517

EEC

Indirect Aids Study — UK shows indirect aids benefit. Jan 37

Electricity Research Centre opens its doors. Sept 506

Energy recovery

Efficient use of industrial energy by Peter Walker. Apr 184

Fuel efficiency — a distributed system by A J Betteridge. Apr 182

Energy conservation within BSC. Apr 188

Heat recovery experience in the iron & steel industry. Apr 190

Replacement of natural gas by coke oven gas in Sollac's cold mill annealing furnaces by A Graas, R Walle & R Koun. Apr 193

Engineering Steels

Phoenix II is United Engineering Steels Ltd. May 246

World's first direct current ladle furnace on trial at Brymbo. May 254

Developments at Aosta Works of Deltasider. May 254

European file by Peter Wood

Crisis at Voest-Alpine, the result of diversification. Jan 8

Flexible EEC quota regime. Feb 56

Sacilor takes over entire control of Unimetal and Ascometal as losses continue. Mar 110

Federal government will support any viable survival plan for Arbed Saarstahl. Apr 170

Way cleared for Saarstahl merger with Dillinger. May 226

New French administration announces massive capital. Jne 278

Finsider losses will continue until 1987. July 334

Major Italian restructuring commences with Cornigliano deal. Aug 392

Spain "alarmed" at steel import penetration No Usinor-Sacilor merger says Gandois. Sept 464

One head for French Steel Ltd will end problems... perhaps. Oct 542

German Steel producers maintain their trading position but fear further liberalisation. Nov 598

F

Ferritic stainless combines machinability with good corrosion resistance. Aug 431

H

Horizontal Continuous Casting

Horizontal continuous casting: Recent developments and future trends. by Manfred Haissig. Nov 546

Recent advances in horizontal continuous casting of speciality steels by A J Zalner and S E Taylor. Nov 549

Electromagnetic billet maker now making blooms in Italy. Nov 554

Hot Rolling

Modelling of the hot rolling process for strip and plate. Jan 34

I

Indirect Aids Study

UK study shows indirect aids benefit France. Jan 37

Induction heating of liquid metals possible with composite ladle material. Aug 430

Industrial Automation — new products. Sept 519

Ingot Casting

Review of teeming stream protection systems for ingot casting by R Schlatter. Aug 432

Injection Metallurgy

Ladle metallurgy and clean steel production by S C McPherson. May 228

Desulphurising pig iron and magnesium cored wire by Dr-Ing Piepenbrock and P Schittly. May 236

Fast growing ladle furnace technology. May 240

Injection metallurgy plants soon to start up treatment of hot metal. May 240

Ladle injection for deoxidation and microalloying by Dr Uday Sinha. May 242

Different types of calcium treatment as a contribution to the development of the continuous casting process by J R Bourguignon, J M Dixmier & J M Henry. Jne 312

Ironmaking Feature

Development of blast furnace operation and control at SSAB, Lüleå by A Ahnqvist, A Boden, B-O Erikson M Sudgren and J O Wikstrom. Dec 652

Developments in ironmaking practice at the Redcar blast furnace. by M M Bowness. Dec 656

Refractories for the rebuild of the Redcar blast furnace at BSC General Steels Teesside Works by S Smith, W C Hardy and M O Warman. Dec 662

Iscor

Novel stove repair technique at Iscor's Newcastle Works. Feb 92

Italy

Italy trades in cautious climate. Apr 172

Italy — No 2 steelmaking in Europe. Apr 174

Nuova Italsider — Italy's largest steel company. Apr 174

Minimills and the long product market in Italy by Patrick Genevaz. Apr 281

M

Marking and Identification

Marking processes for the steel industry by M Darley and I Barlow. Oct 569

Ink marking in the steel industry. Oct 572

Colour coding for stockholders. Oct 572

Aluminium spray marking of hot steel slabs. Oct 576

Cold marking of plate and test pieces. Oct 578

Continuous steel making technology. Oct 580

New UK source for steel marking type. Oct 580

Bar code reader range for materials handling. Oct 580

Melting Pot by Keith Gale

How old is steel? Steam on the way back. More recycling. Jan 44

Steel Poles. Prophetic Words? Metric ships. Product definitions. Feb 100

Stewed Steel. Weight calculations. The reversing mill. Energy crisis? Mar 155

The image of industry. Aluminium-100. A wall of tuyeres. Apr 210

Smokestacks. When is a foundry not a foundry? Quality standards. May 266

Who invented what and when? Elephant power, Don't tell the press. Confusion compounded. Jne 322

Forging & stamping. Industry old and new. No more Colclad or Sheep may safely graze! Control assurance. Jly 364

Protective clothing. Noise for pleasure? Aug 448

Forecasts & guesses. Training by video. Steel versus plastics. Steels and standards. Sept 524

Labour shortage. Shoes, screws and cogs. Steel smelters? Oct 583

Repair in situ. Industrial espionage. Confused by initials? Nov 634

HIPping. Earthquake proof. Big beams. Dec 683

Metal Cleanliness

Characterisation of inclusions in Southwire wheel-belt continuous cast steel billets by U K Sinha, G R Patel and E H Chia. Aug 438

Metallurgical Plant '86 preview. Aug 396

Exhibitor Guide to Metallurgical Plant. Aug 398

Micro control on flying shear at Aldwarke Steelworks. Aug 446

Minimills react to changing markets. May 256

Editorial Index to Volume 214

January to December 1986

A

Annual Technical Review of European Steelmaking. Sept 470

120th Anniversary

From Bessemer to microprocessor by W K V Gale. Feb 60

B

BISPA Annual Review

BISPA cooperates more closely with BSC by P Johnson. Mar 113

Static demand for BISPA products by B D Insch. Mar 113

Brymbo's new inspection line retains the accent on quality. Mar 121

Sheerness invests in process control. Mar 124

Quality key to bright bar success. Mar 128

UMB is 'fit for purpose'. Mar 129

Brasway Tubes installs six cut-to-length saws. Mar 142

Bromford Iron & Steel

Hot rolling at Bromford Iron & Steel by W K V Gale. Sept 510

BSC

BSC Teesside works introduces continuously cast slabs for rolling heavy beams and columns. Feb 97

Rotary valve helps raise CC ratio at Teesside Works. Mar 152

Ceramic stopper reduces slag carry over at Lackenby BOS plant. Jne 318

BSC Ravenscraig repairs reversing rougher mill housing. Jne 318

BSC's No 6 hot dip coating line comes on stream. Jly 338

Western Europe's biggest BF starts second campaign at Redcar. Oct 558

Corrosion protection of gas distribution mains (Llanwern). Nov 622

Bulk Materials Handling

Dynamic measurement on stacker/reclaimer. Jne 295

Special purpose transport systems for intra-plant handling. Jne 298

Sub contracting as an effective means of bulk handling. Jne 300

BSC Port Talbot installs in-motion weighing. Jne 302

Bulk discharging system for shipboard or quayside installation. Jne 304

C

Coal injection in steelmaking

Coal injection in steelmaking — a summary of current technology. Feb 76

The ALCI process — Arbed Lance Coal Injection by J Goedert, H Klein, R Henrion, J F Liesch. Feb 80

KMS process for coal injection in the converter. Feb 83

Steelmaking using the EOF. Feb 88

Pulverised coal — a novel metering system. Feb 90

Klöckner sells KMS license to Japan and agrees coal based stainless steelmaking venture. Feb 92

Continuous annealing at Hoesch Stahl AG. Apr 198

Continuous annealing of steel strip by Rodney Pitt. Jan 28

Control of rolling

Process control of flat and long product rolling. Nov 604

On-line optical gauging of steel rolling processes. Nov 608

Models for modern rolling mills. Nov 610

Extension of rolling mill examination systems to cover microstructural phenomena by E Anelli, M Ghersi, A Mascanzoni, A Aprile, G Rizzo. Nov 612

Off-line rolling mill modelling. Nov 616

Crop shear for hot strip at Solmer. Nov 618

Combination tension and screwdown AGC for cold reversing mills. Nov 620

Rapid setting up of rod and bar mills. Nov 620

D

DC arc furnace

DC arc furnace in full production at French minimill. Apr 204

Operation of the dc arc furnace at Nucor. Jly 344

E

ECSC Research — in iron & steel

Pollution control. Aug 447

Steelmaking, Refractories, Inspection. Sept 516

Continuous casting. Sept 517

EEC

Indirect Aids Study — UK shows indirect aids benefit. Jan 37

Electricity Research Centre opens its doors. Sept 506

Energy recovery

Efficient use of industrial energy by Peter Walker. Apr 184

Fuel efficiency — a distributed system by A J Betteridge. Apr 182

Energy conservation within BSC. Apr 188

Heat recovery experience in the iron & steel industry. Apr 190

Replacement of natural gas by coke oven gas in Sollac's cold mill annealing furnaces by A Graas, R Walle & R Koun. Apr 193

Engineering Steels

Phoenix II is United Engineering Steels Ltd. May 246

World's first direct current ladle furnace on trial at Brymbo. May 254

Developments at Aosta Works of Deltasider. May 254

European file by Peter Wood

Crisis at Voest-Alpine, the result of diversification. Jan 8

Flexible EEC quota regime. Feb 56

Sacilor takes over entire control of Unimetal and Ascometal as losses continue. Mar 110

Federal government will support any viable survival plan for Arbed Saarstahl. Apr 170

Way cleared for Saarstahl merger with Dillinger. May 226

New French administration announces massive capital. Jne 278

Finsider losses will continue until 1987. July 334

Major Italian restructuring commences with Cornigliano deal. Aug 392

Spain "alarmed" at steel import penetration No Usinor-Sacilor merger says Gandois. Sept 464

One head for French Steel Ltd will end problems... perhaps. Oct 542

German Steel producers maintain their trading position but fear further liberalisation. Nov 598

F

Ferritic stainless combines machinability with good corrosion resistance. Aug 431

H

Horizontal Continuous Casting

Horizontal continuous casting: Recent developments and future trends. by Manfred Haissig. Nov 546

Recent advances in horizontal continuous casting of speciality steels by A J Zalner and S E Taylor. Nov 549

Electromagnetic billet maker now making blooms in Italy. Nov 554

Hot Rolling

Modelling of the hot rolling process for strip and plate. Jan 34

I

Indirect Aids Study

UK study shows indirect aids benefit France. Jan 37

Induction heating of liquid metals possible with composite ladle material. Aug 430

Industrial Automation — new products. Sept 519

Ingot Casting

Review of teeming stream protection systems for ingot casting by R Schlatter. Aug 432

Injection Metallurgy

Ladle metallurgy and clean steel production by S C McPherson. May 228

Desulphurising pig iron and magnesium cored wire by Dr-Ing Piepenbrock and P Schittly. May 236

Fast growing ladle furnace technology. May 240

Injection metallurgy plants soon to start up treatment of hot metal. May 240

Ladle injection for deoxidation and microalloying by Dr Uday Sinha. May 242

Different types of calcium treatment as a contribution to the development of the continuous casting process by J R Bourguignon, J M Dixmier & J M Henry. Jne 312

Ironmaking Feature

Development of blast furnace operation and control at SSAB, Lüleå by A Ahnqvist, A Boden, B-O Erikson M Sudgren and J O Wikstrom. Dec 652

Developments in ironmaking practice at the Redcar blast furnace. by M M Bowness. Dec 656

Refractories for the rebuild of the Redcar blast furnace at BSC General Steels Teesside Works by S Smith, W C Hardy and M O Warman. Dec 662

Iscor

Novel stove repair technique at Iscor's Newcastle Works. Feb 92

Italy

Italy trades in cautious climate. Apr 172

Italy — No 2 steelmaking in Europe. Apr 174

Nuova Italsider — Italy's largest steel company. Apr 174

Minimills and the long product market in Italy by Patrick Genevaz. Apr 281

M

Marking and Identification

Marking processes for the steel industry by M Darley and I Barlow. Oct 569

Ink marking in the steel industry. Oct 572

Colour coding for stockholders. Oct 572

Aluminium spray marking of hot steel slabs. Oct 576

Cold marking of plate and test pieces. Oct 578

Continuous steel making technology. Oct 580

New UK source for steel marking type. Oct 580

Bar code reader range for materials handling. Oct 580

Melting Pot by Keith Gale

How old is steel? Steam on the way back. More recycling. Jan 44

Steel Poles. Prophetic Words? Metric ships. Product definitions. Feb 100

Stewed Steel. Weight calculations. The reversing mill. Energy crisis? Mar 155

The image of industry. Aluminium-100. A wall of tuyeres. Apr 210

Smokestacks. When is a foundry not a foundry? Quality standards. May 266

Who invented what and when? Elephant power, Don't tell the press. Confusion compounded. Jne 322

Forging & stamping. Industry old and new. No more Colclad or Sheep may safely graze! Control assurance. Jly 364

Protective clothing. Noise for pleasure? Aug 448

Forecasts & guesses. Training by video. Steel versus plastics. Steels and standards. Sept 524

Labour shortage. Shoes, screws and cogs. Steel smelters? Oct 583

Repair in situ. Industrial espionage. Confused by initials? Nov 634

HIPping. Earthquake proof. Big beams. Dec 683

Metal Cleanliness

Characterisation of inclusions in Southwire wheel-belt continuous cast steel billets by U K Sinha, G R Patel and E H Chia. Aug 438

Metallurgical Plant '86 preview. Aug 396

Exhibitor Guide to Metallurgical Plant. Aug 398

Micro control on flying shear at Aldwarke Steelworks. Aug 446

Minimills react to changing markets. May 256

O
On-line inspection
Hot on-line crack detection of CC slabs. Jly 362

P
Plant Enhancement
The plant enhancement programme by J W Jaffe. Aug 414
Microprocessor-controlled wire-rod cooling at Templeborough Rolling Mills. Aug 424
Enhanced heat-treatment furnace management. Aug 424
Top gas pressure recovery improves BF economics. Aug 427
Automatic lubrication systems in the maintenance management of steelworks by D Macklin. Aug 428
Platemaking
MULPIC — a novel process of accelerated cooling for plates by S Wilmotte, H Caponet & M Economopulos. Jne 280
Low-cost plate mill improvements by L J Fenstermaker. Jne 287
Application of work roll shift mill to plate rolling. Jne 292
Improving the yield in the rolling of thick plates by monitoring the product ends. Aug 443
Crown — a computer program for on-line calculation of plate profile, flatness & temperature in 4 high mills by Nils-Göran Jonsson. Aug 444
Pollution Control
ECSC Research — in iron and steel. Aug 447

Q
Quality management in chemical analysis BSC/BISPA Chemists' Conference. Sept 500
Quality Management
Gearing up for statistical process control by Dennis Hadfield. Jly 348
Queenborough Rolling Mill Company Ltd (QRM)
Profitable rail rerolling on the right tracks. Nov 621
Quest for Quality
Materials Testing '86 Exhibition. Mar 145

R
Radiation thermometry in ironmaking processes. Apr 200
Refractories
Development and application of ceramic fibre anchored modules by Lawrence Ball. Feb 94
Development of refractories for BF troughs. May 260
Improved service life for steelmaking refractories by Manfred Oberach. Jly 350
Refractories Maintenance
Ceramic welding — the coke oven refractory life support system by Anthony V Parry. Dec 674
Repairs to degassing nozzles. Dec 675
Flame gunning repair of hot BOF converters. Dec 680
Precast piece for repairs of converter tap-holes. Dec 680
Restructuring steel plants for the nineties. Jly 352
Rod, Bar & Wire
Recent developments in wire drawing by Edgar P Riley-Gledhill. Jan 12
Energy saving and quality improvement at Krupp's Hagen wire rolling mill. Jan 17
Computer programs for rod rolling and wire drawing. Jan 17
Modernisation of mill equipment and product development for wire rod. Jan 20
New slit rolling technology for producing deformed bars. Jan 21
Increased emphasis on rod mill product quality. Jan 26
Rollmaking
Manufacture of cast rolls. Mar 132
Midland Rollmakers, R B Tennant & Miller & Co Ltd. Akers International AB — the only roll maker in Scandinavia. Mar 136
Manufacture of forged rolls. Forged Rolls (UK) Ltd. Mar 138
Rotary valve raises concast reliability and cuts costs. Jan 40
Rotherham Engineering Steels
Investment continues at Rotherham Engineering Steels. Sept 492
EBT developments at Rotherham Engineering Steels-Aldwarke Melting shop by P Mills and D S Thornton. Sept 496

S
Segal galvanising line comes on stream. Dec 666
Service Centre
Brown & Tawse opens Cardiff branch. Jan 45
Flatter plates from GKN Profiles. Jan 46
Tough times for steel stockholders. Feb 101
GKN Steelstock invests in processing equipment. Mar 156
Alloy & Metal contract fleet management. Mar 157
Avoiding the computer minefield by Darren Duesbury. Apr 213
Steady but cautious improvement reported by Greene & Co. May 268
High bay stock handling at Bell & Harwood. Jne 323
Stockholders share of UK market drops in year of price list rules removal. Jly 368
Air-bearing transporters move 30t coils at BSC Stocksbridge. Aug 451
3CR12 now available in spiral wound tube. Aug 452
Perry commissions wide blanking line. Sept 530
Midlands stockholder offer wide processing capability. Oct 584
BSSC makes profits through low cost operations. Nov 636
Quality stainless from Baigent & Bird in a volatile climate. Dec 684
Expansion and diversification at Batchelors Steel Service Centres. Dec 685
Slag Processing
Slag — a nuisance or an opportunity. Nov 624
Dry granulation and heat recovery from partly solidified slag droplets by J C Harris and N A Warner. Nov 626
Slag in road construction. Nov 628
Slag granulation system for Algoma Steel. Nov 629
Slag removal by vacuum cleaner. Nov 629
Physiochemical properties of BOS slags. Nov 629
Favourable electricity charges aid French minimill Societe des Acieries de Montereau (SAM). Jne 308
Stainless Steel
The Stainless Steel Advisory Centre. Jly 360
Stainless Steelmakers meet in France. Sept 508
Stainless steel in search of new image. Dec 671
Demand increases for stainless but overcapacity may be a problem. Dec 672

V
Vacuum steel production by the RH process is gaining ground. Aug 431
Vacuum Technology
Vacuum techniques for improved metallurgy (Leybold Heraeus). Jly 339
Re-use of vacuum plant establishes value of original concept (Vacmetal). Jly 340
Vacuum heat treatment has many applications (Consarc Corp NJ). Jly 342
VEB-Stahl
Brandenburg modernises steelmaking plant. Oct 566

W
Rebirth of a wrought ironworks. Apr 206

Authors
Ahnqvist A Dec 652
Anelli E Nov 612
Aprile A Nov 612
Ball Lawrence Feb 94
Barlow I Oct 569
Betteridge A J Apr 182
Boden A Dec 652
Bourguignon J R Jne 312
Bowness M M Dec 656
Caponet H Jne 280
Chia E H Aug 438
Darley M Oct 569
Dixmier J M Jne 312
Duesbury Darren Apr 213
Economopulos M Jne 280
Erikson B O Dec 652
Fenstermaker L J Jne 287
Gale W K V 44, 60, 100, 155, 210, 266, 322, 364, 448, 510, 524, 583, 634, 683
Genevaz Patrick Apr 182
Ghersi M Nov 612
Goedert J Feb 80
Graas A Apr 193
Hadfield Dennis Jly 348
Haissig Manfred Oct 546
Hardy W C Dec 662
Harris J C Nov 626
Henrion R Feb 809
Henry J M Jne 312
Insch B D Mar 113
Johnson P Mar 113
Jonsson Nils-Göran Aug 444
Klein H Feb 80
Koun R Apr 193
Liesch J F Feb 80
Mascanzoni A Nov 612
McPherson S C May 228
Mills P Sept 496
Oberach Manfred Jly 350
Patel G R Aug 438
Parry Anthony V Dec 674
Piepenbrock Dr-Ing May 236
Pitt Rodney Jan 28
Riley-Gledhill Edgar P Jan 12
Rizzo G Nov 612
Schittly P May 236
Schlatter R Aug 432
Sinha Dr. Uday May 242
Aug 438
Smith S Dec 662
Sudgren M Dec 652
Taylor S E Oct 549
Thornton D S Sept 496
Walle R Apr 193
Walker Peter Apr 184
Warman M O Dec 662
Warner N A Nov 626
Wikstrom J O Dec 652
Wilmotte S Jne 280
Wood Peter 8, 56, 110, 170, 226, 278, 334, 392, 464, 542, 598, 648
Zalner A J Oct 549

INDEX TO ADVERTISERS

AJO ANLAGENTECHNIK GMBH & CO KG 647
ALCOA SA 677
ALTIM CONTROL 661
ASSOCIATION OF IRON & STEEL ENGINEERS 690
B.J. CONSTRUCTION LIMITED F. COVER
BSC REDCAR 657
CEFRAC 679
COCKERILL MECHANICAL 667
DANGO & DIENENTHAL MASCHINENBAU GMBH I.F.C.
DOLOMITWERKE GMBH 645
ELECTRO REFRACTAIRE 676
FERRANTI COMPUTER SYSTEMS LIMITED 659
GEOTRONICS AB 655
INDUSTRIAL TOOL ENGINEERING CORP. 667
LONDON & SCANDINAVIAN METALLURGICAL CO LTD I.B.C.
MAPEKO GMBH 667
METFORM ENGINEERING 661
NUOVO ITALSIDER 663
SEGAL COMMERCIAL 668-669
SHANKS & MCEWAN 679
SIGRI GMBH O.B.C.
SOMERS HANDLING 651
SPECTRO ANALYTICAL UK LTD 651
GR STEIN REFRACTORIES LIMITED 679